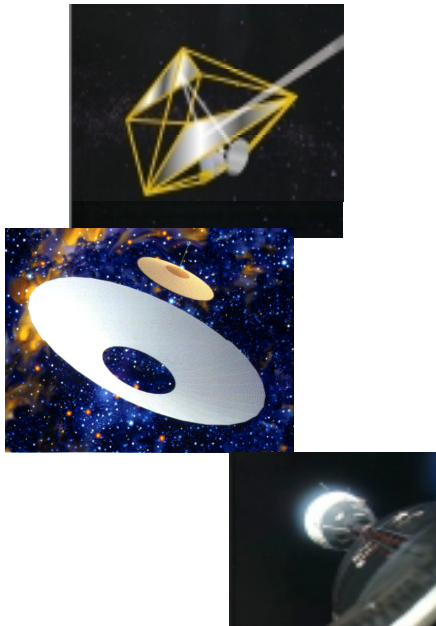


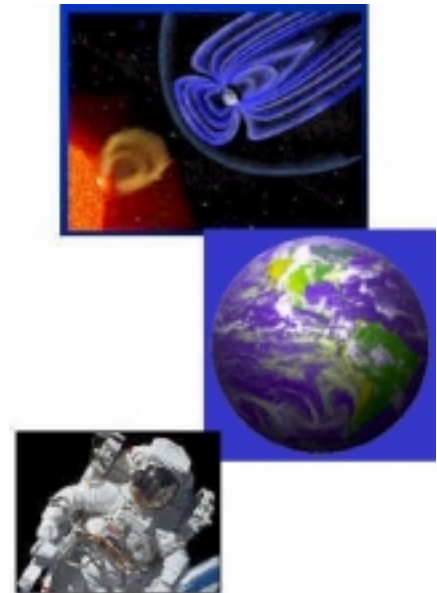


Opening Remarks and Workshop Objectives

*Presented at the New Millennium Program (NMP)/
Living With a Star (LWS) Program's Space
Environment Testbed (SET)
Space Technology Provider Workshop*



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Washington, DC 20546
August 23-24, 2000*





Background



- ***The Fiscal Year 2001 President's Budget contained:***
 - *Reinstated funding for the New Millennium Program*
 - *Funding for the Living With a Star Program*
- ***NASA's budget has not been approved by Congress at this time***
- ***Both Programs contain funding for flight validation and performance characterization of sub-systems in the space environment***
 - *Sub-systems are stand-alone experiments*
 - ***They do not replace proven hardware to perform critical spacecraft functions in the flight project***
 - ***Failure of a single technology in a subsystem flight validation does not compromise the successful validation of the remainder of the technologies in the project***



NMP and LWS Programs



NMP



The New Millennium Program develops and flight validates breakthrough technologies to retire risk of first use before they can significantly benefit future science missions

Variable Star



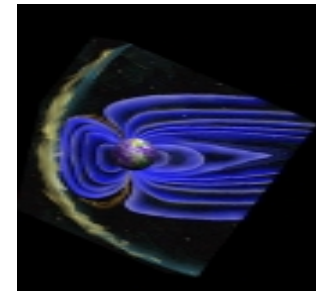
Varying

- Radiation
- Solar wind
- Energetic particles

Interacting

- Solar wind
- Energetic particles

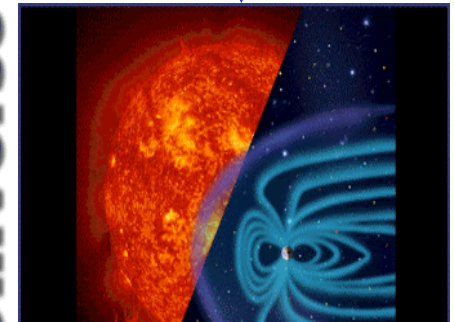
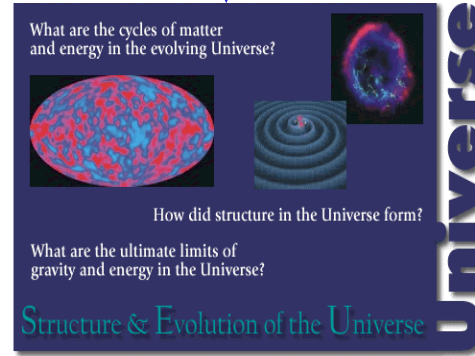
Earth



Living With A Star is a new NASA initiative to understand solar variability, to mitigate or accommodate its undesirable effects on humans & human technology, and to understand how it affects hardware performance & operations in space



Organizational Perspective



THE SUN EARTH CONNECTION





Funding for Technology Development is a Function of the Technology Readiness Level (TRL)



NMP

Basic Principles Observed & Reported
Conceptual Design Formulated
Conceptual Design Tested Experimentally
Critical Hardware Tested
Pre-Prototype Tested
Prototype Developed to Qualify
Engineering Model Tested in Space
Operational

Technology Readiness Levels

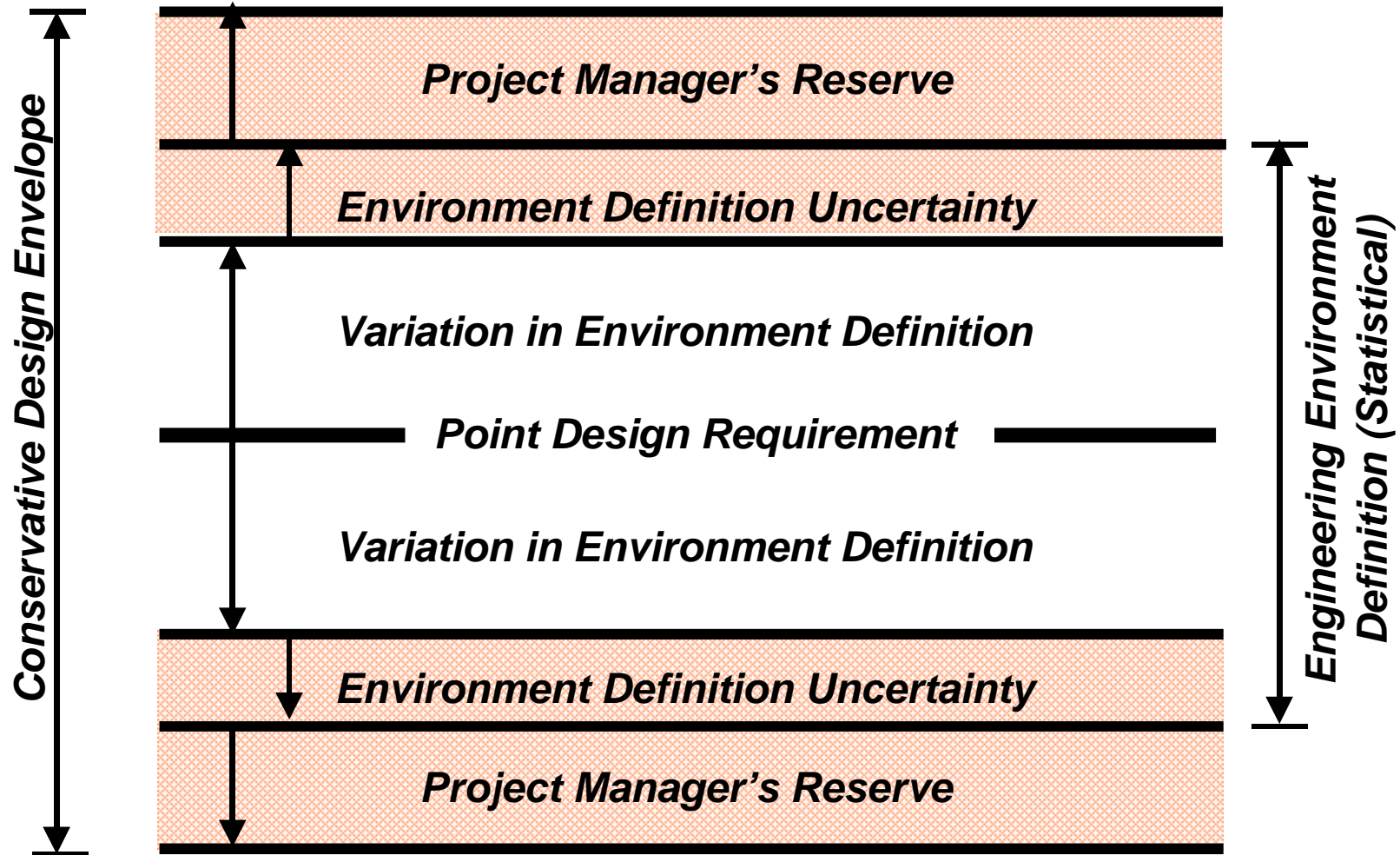
1	2	3	4	5	6	7	8
Advanced Concepts							
Cross-Enterprise			Cross-Enterprise				
		Space Science-Mission-Unique					
					Mission-Unique Development		
			New Millennium Program (Not Mission-Unique)				
			LWS Space Environment Testbed (Solar Variability-Dependent or LWS-Unique)				

Technology Providers

Infusion into New Science Missions



Reducing the Uncertainties & Manager's Reserves for Space Operation Improves Performance & Reduces Cost & Risk





Goal: Seamless Transition from the Collection Science Data to the Improved Use of Technology in New Science Missions



Research Programs: Define & implement the science strategic roadmap; develop technology validation roadmap to retire risk for first use of technology in new science missions

***Research
Results/Data***

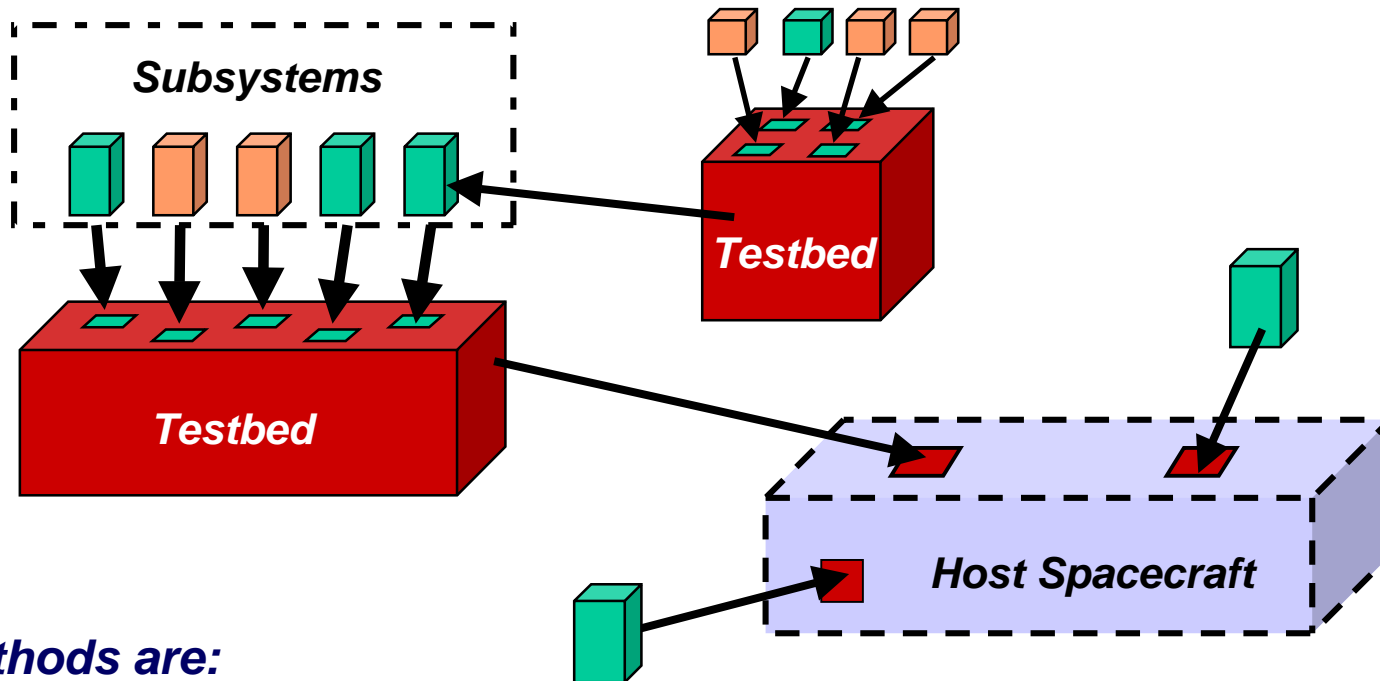
Technology Development & Validation: Update models, databases, design guidelines; perform flight experiments to demonstrate performance & develop technology

***Technology Infusion into
Future Missions
(Customers)***

Design & Operations Programs: Implement accurate accommodations & new technology into new science missions



Methods for Subsystem Technology Validations



- **Methods are:**
 - Subsystems directly interface to host spacecraft as secondary payloads
 - Subsystems interface to testbeds
- **What is a testbed? Common support hardware & software to validate several sub-systems or components**
 - Facilitates harvesting sub-systems & components early in development for rapid infusion



NMP- or LWS SET funded subsystem



Not NMP- or LWS SET-funded subsystem; partnering

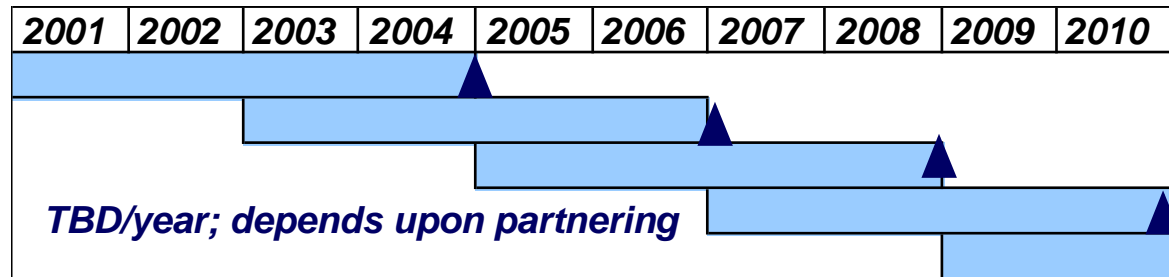


Planned Technology Flight Validation Opportunities in the NMP & LWS SET Programs



LWS SET

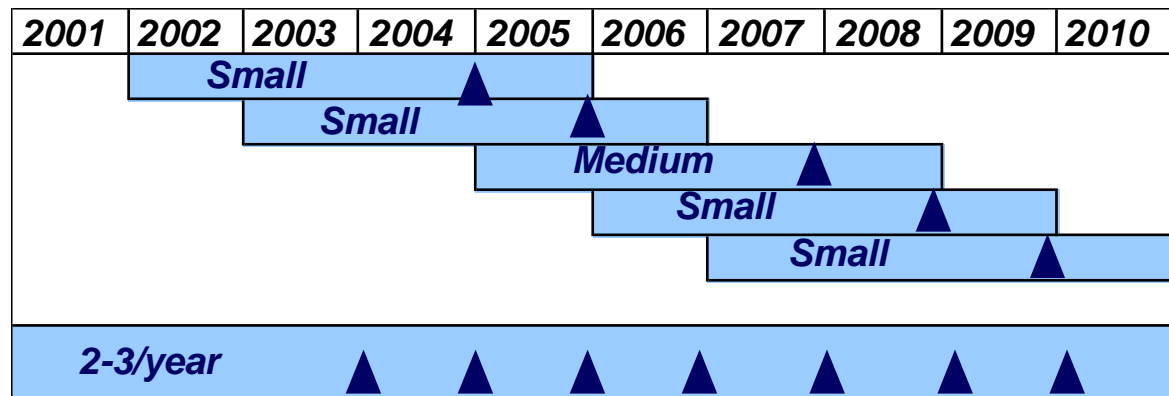
Subsystem Validations



Restored NMP

System Validations:
3 every 4 years

Subsystem Validations



- Notes:** (1) Funding for validations includes adapters for secondary payloads (if applicable), launches, & MO/DA.
 (2) All subsystems are assumed to be secondary payloads.
 (3) Systems may replace proven technologies to provide critical spacecraft functions.
 (4) ▲ = Launch



Workshop Objectives



- ***During these workshop briefings, we will describe:***
 - *The Living With a Star and New Millennium Programs*
 - *Draft versions of flight validation requirements*
 - *Flight validation opportunities*
- ***We solicit workshop participation in refining the LWS SET and NMP technology space test and validation requirements***
 - *Breakout sessions will focus on 7 technology areas of interest*
- ***We seek new ideas from potential technology providers for flight validation***
 - *We can discuss the ideas in breakout sessions and/or private discussions*
- ***We seek partners in technology development, flight validation, and access to space***
- ***We will use the workshop information to mature the testbed & program concepts and to develop competitive procurements to select the flight candidates***